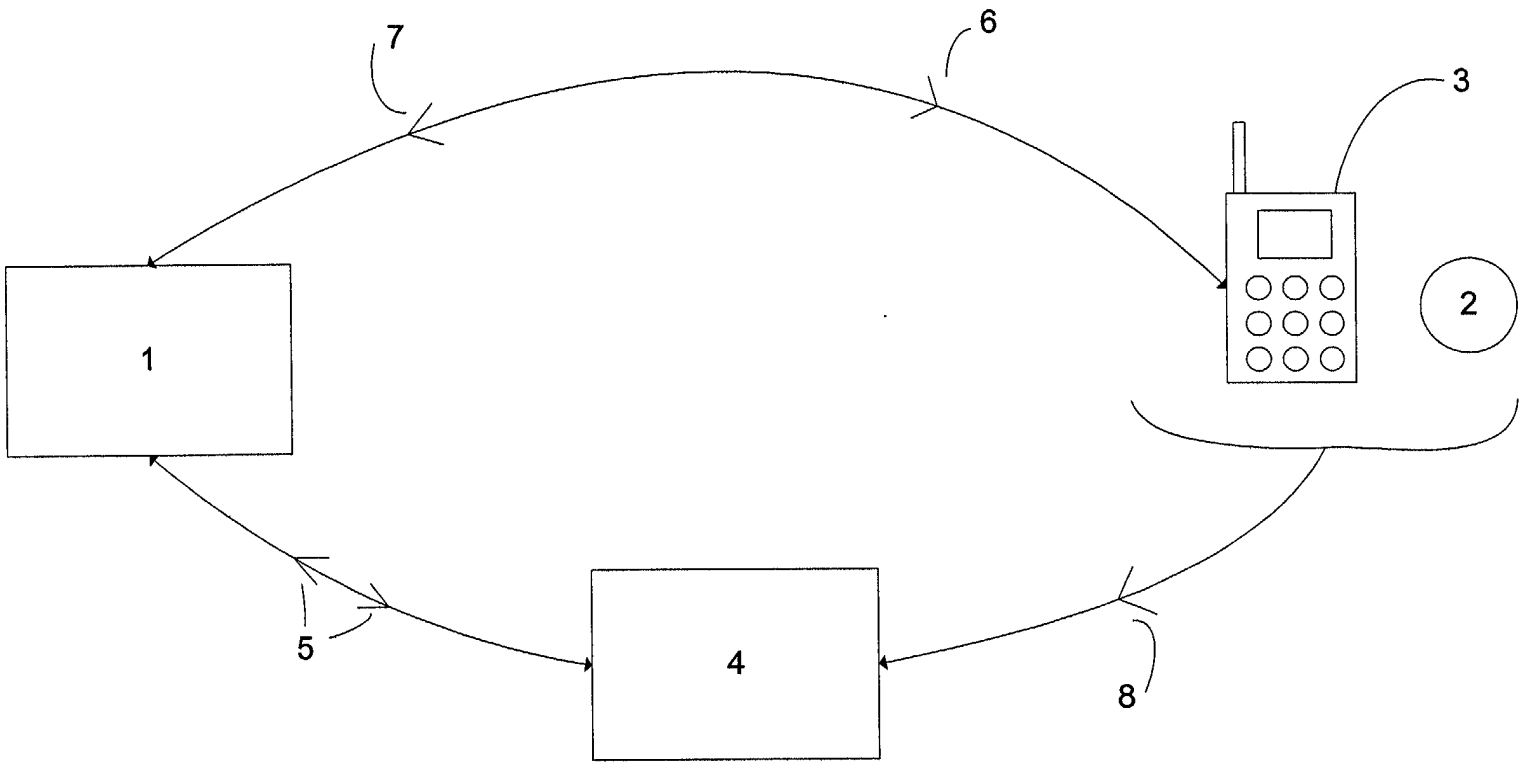

FIGURE 1

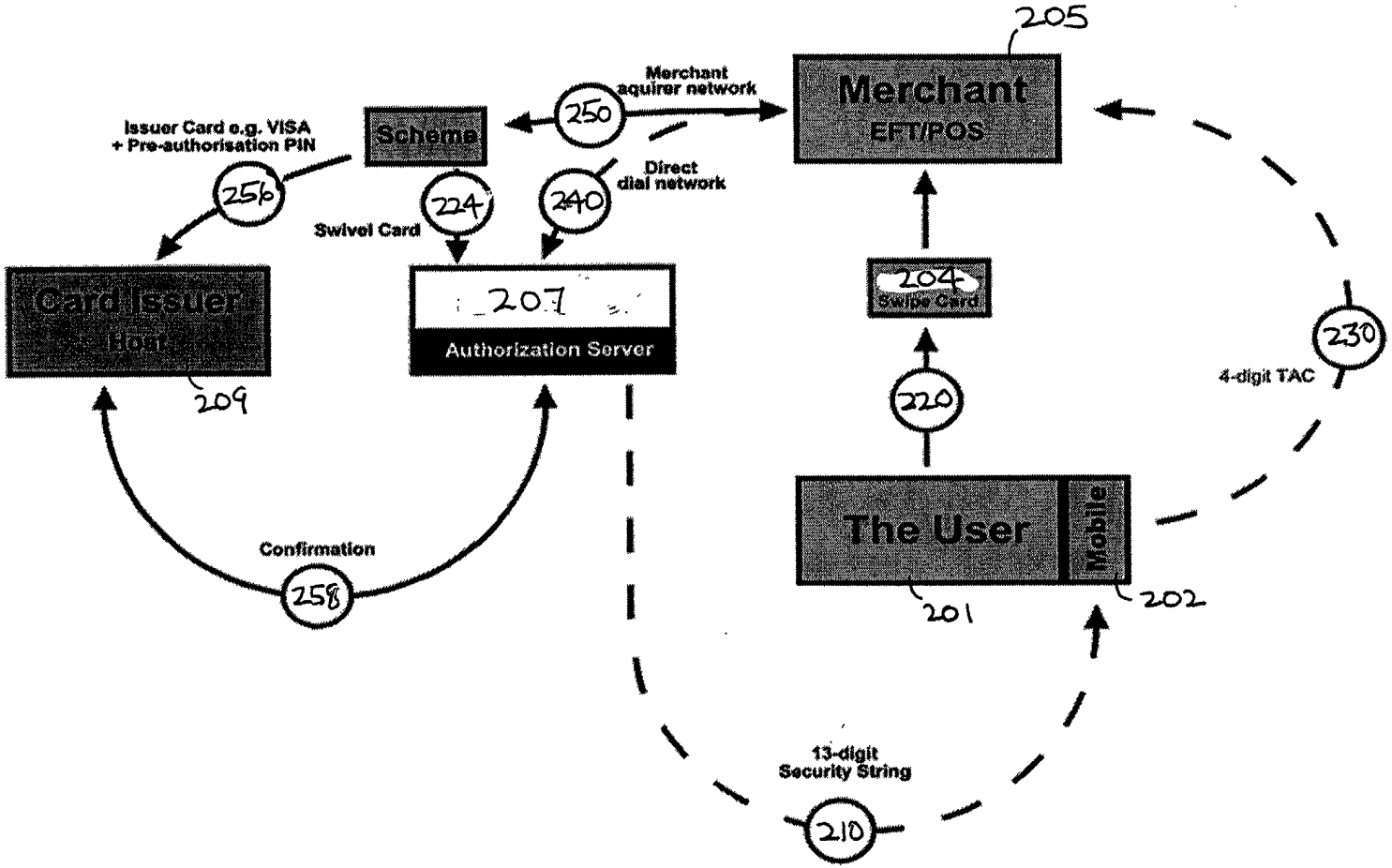
205
Merchant
EFT/POS
Merchant
aquirer network
250
Scheme
Issuer Card e.g. VISA
+ Pre-authorisation PIN
256
224
Swivel Card
240
Direct
dial network
Card Issuer
Host
209
207
Authorization Server
204
Swipe Card
230
4-digit TAC
220
The User
Mobile
201
202
Confirmation
258
13-digit
Security String
210

Figure 2

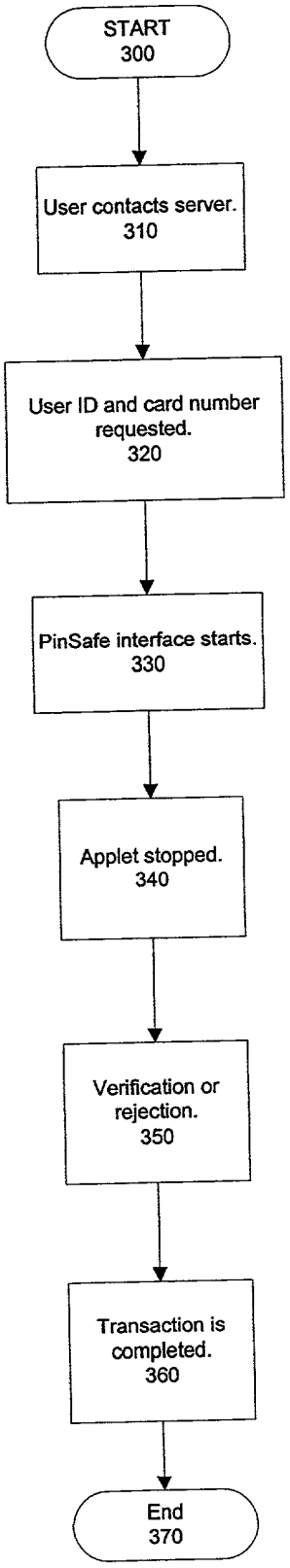
START
300
User contacts server.
310
User ID and card number requested.
320
PinSafe interface starts.
330
Applet stopped.
340
Verification or rejection.
350
Transaction is completed.
360
End
370

FIGURE 3

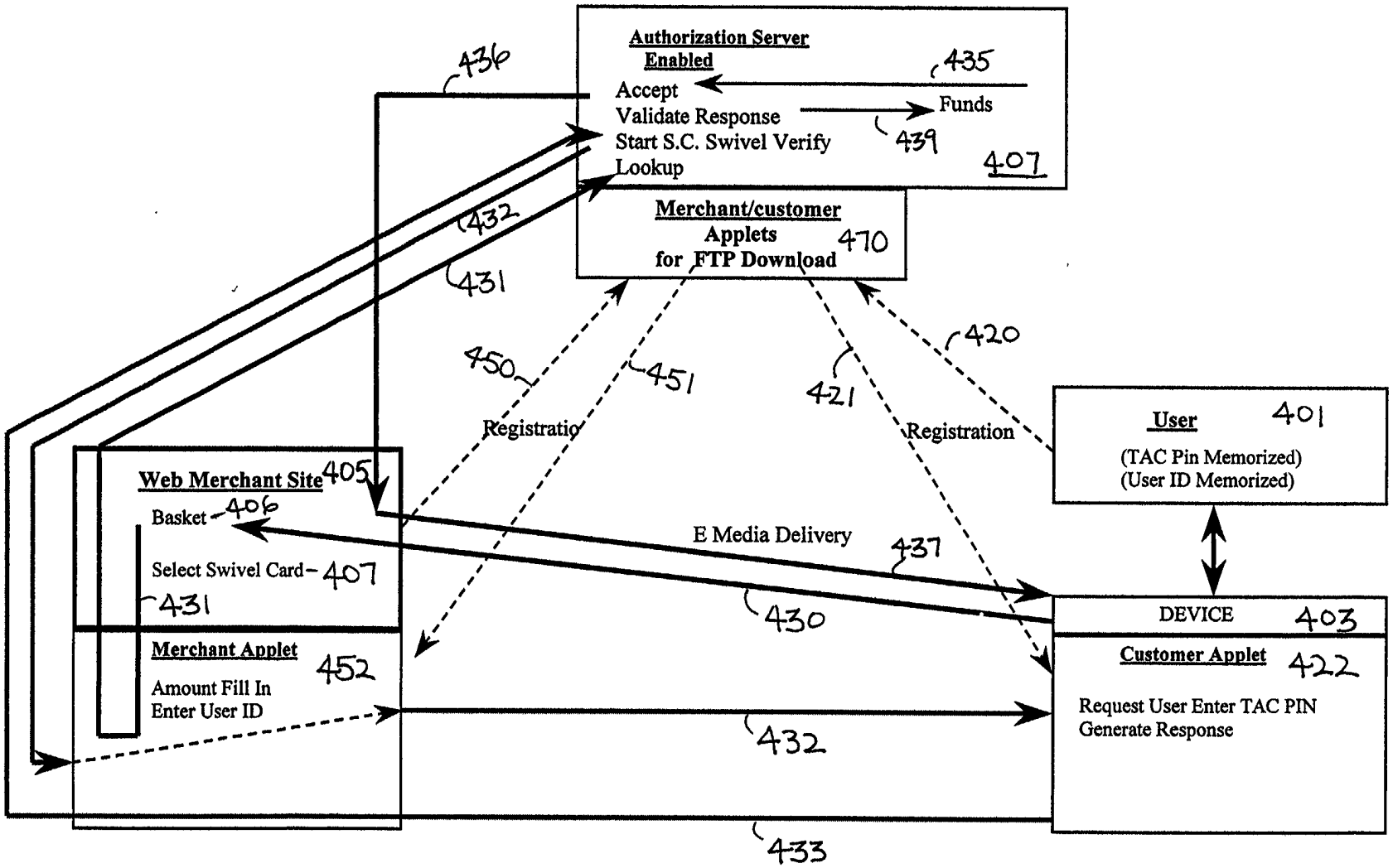
Authorization Server
Enabled
435
Accept
Validate Response
Funds
Start S.C. Swivel Verify
439
Lookup
407
436
Merchant/customer
Applets
470
for FTP Download
432
431
420
450
451
421
Registratio
Registration
User
401
(TAC Pin Memorized)
(User ID Memorized)
Web Merchant Site 405
Basket 406
E Media Delivery
437
Select Swivel Card 407
431
430
DEVICE
403
Merchant Applet
452
Customer Applet
422
Amount Fill In
Enter User ID
Request User Enter TAC PIN
Generate Response
432
433

FIGURE 4

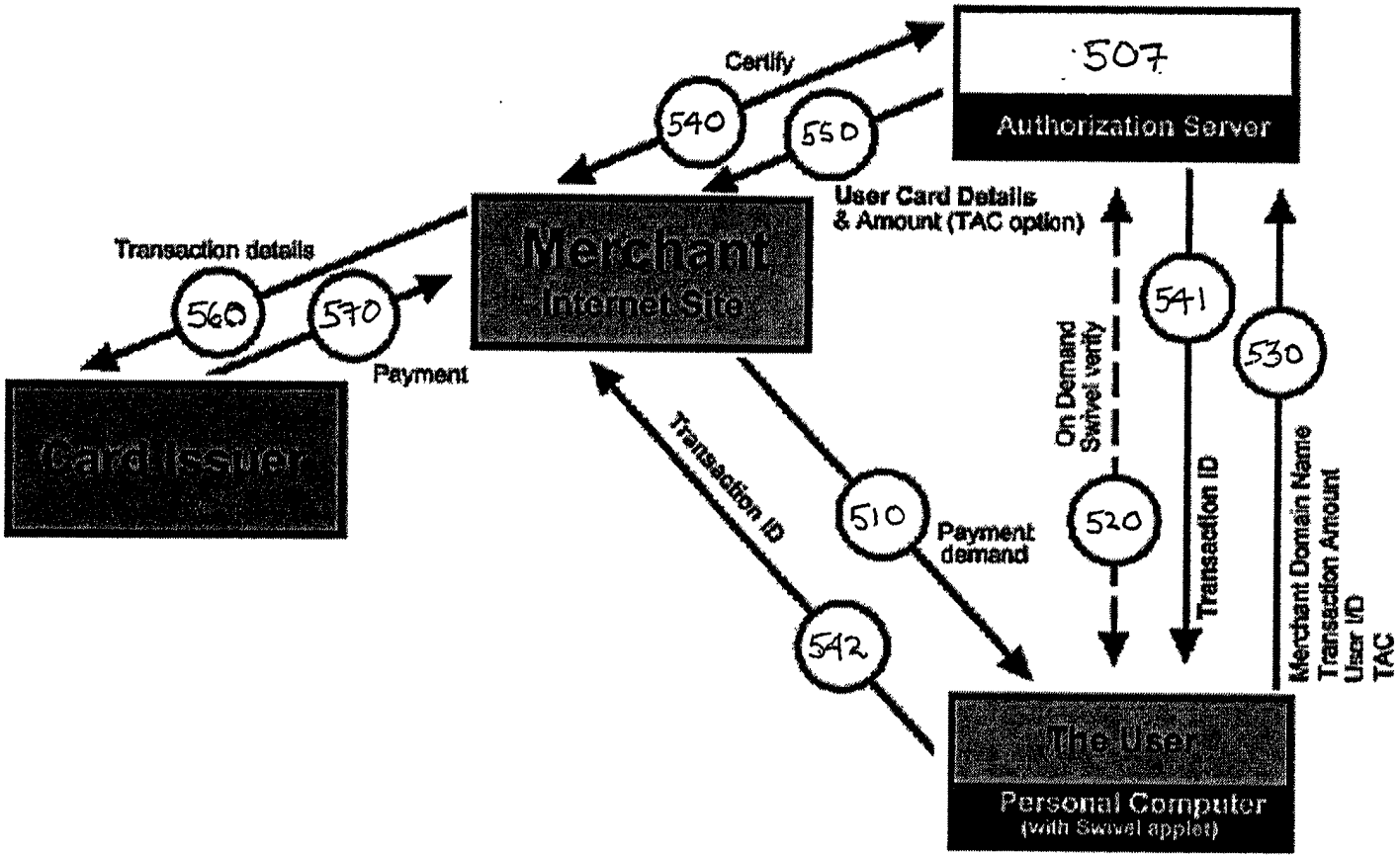
507
Authorization Server
Certify
540
550
User Card Details
& Amount (TAC option)
Merchant
Internet Site
Transaction details
560
570
Payment
Card Issuer
On Demand
Swivel verify
541
530
520
Transaction ID
Merchant Domain Name
Transaction Amount
User ID
TAC
Transaction ID
510
Payment
demand
542
The User
Personal Computer
(with Swivel applet)

Figure 5

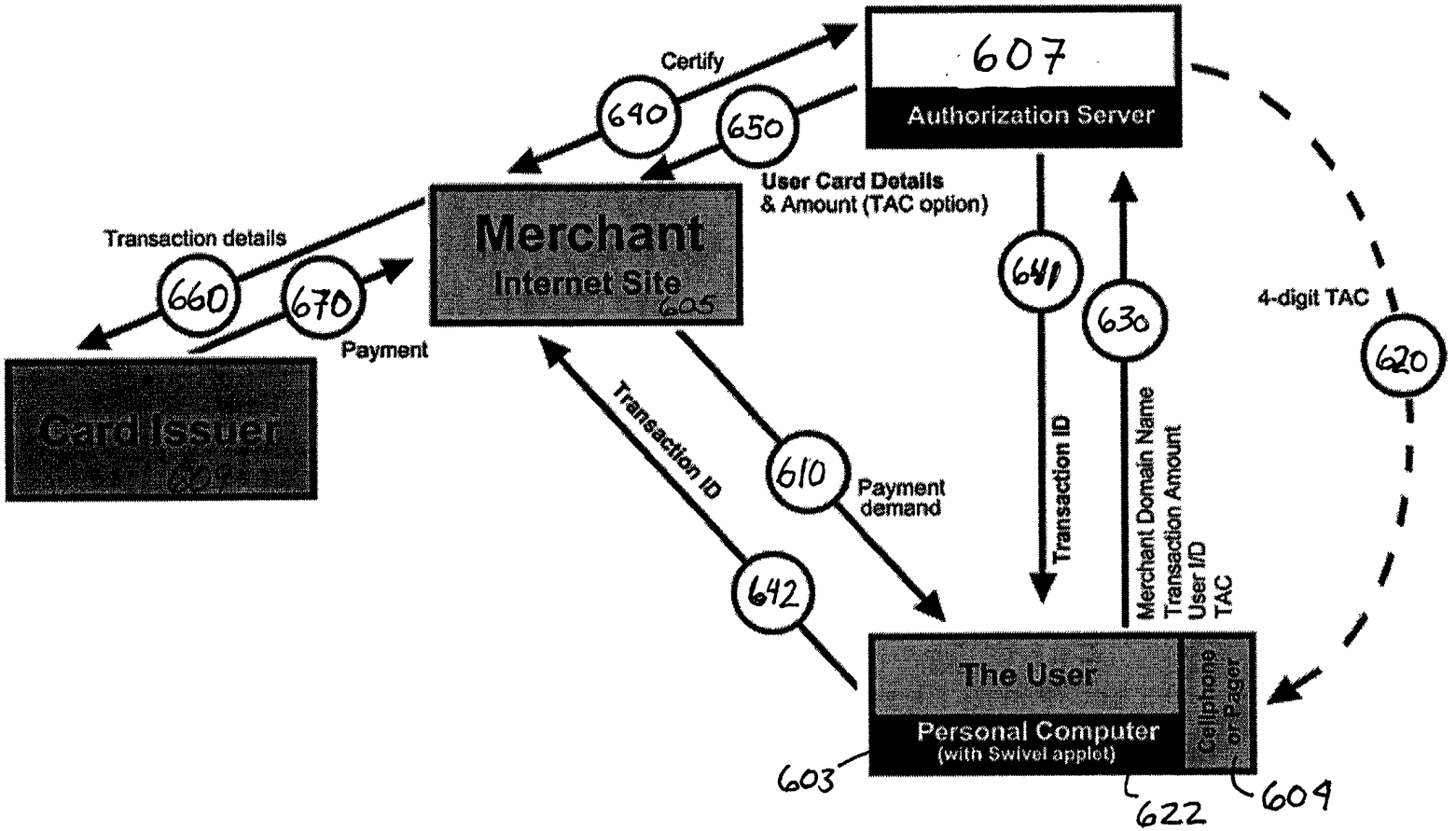
607
Authorization Server
Certify
640
650
User Card Details
& Amount (TAC option)
Merchant
Internet Site
605
Transaction details
660
670
Payment
Card Issuer
602
Transaction ID
610
Payment
demand
642
641
630
Transaction ID
Merchant Domain Name
Transaction Amount
User I/D
TAC
4-digit TAC
620
The User
Personal Computer
(with Swivel applet)
Cellphone
or Pager
603
622
604

Figure 6

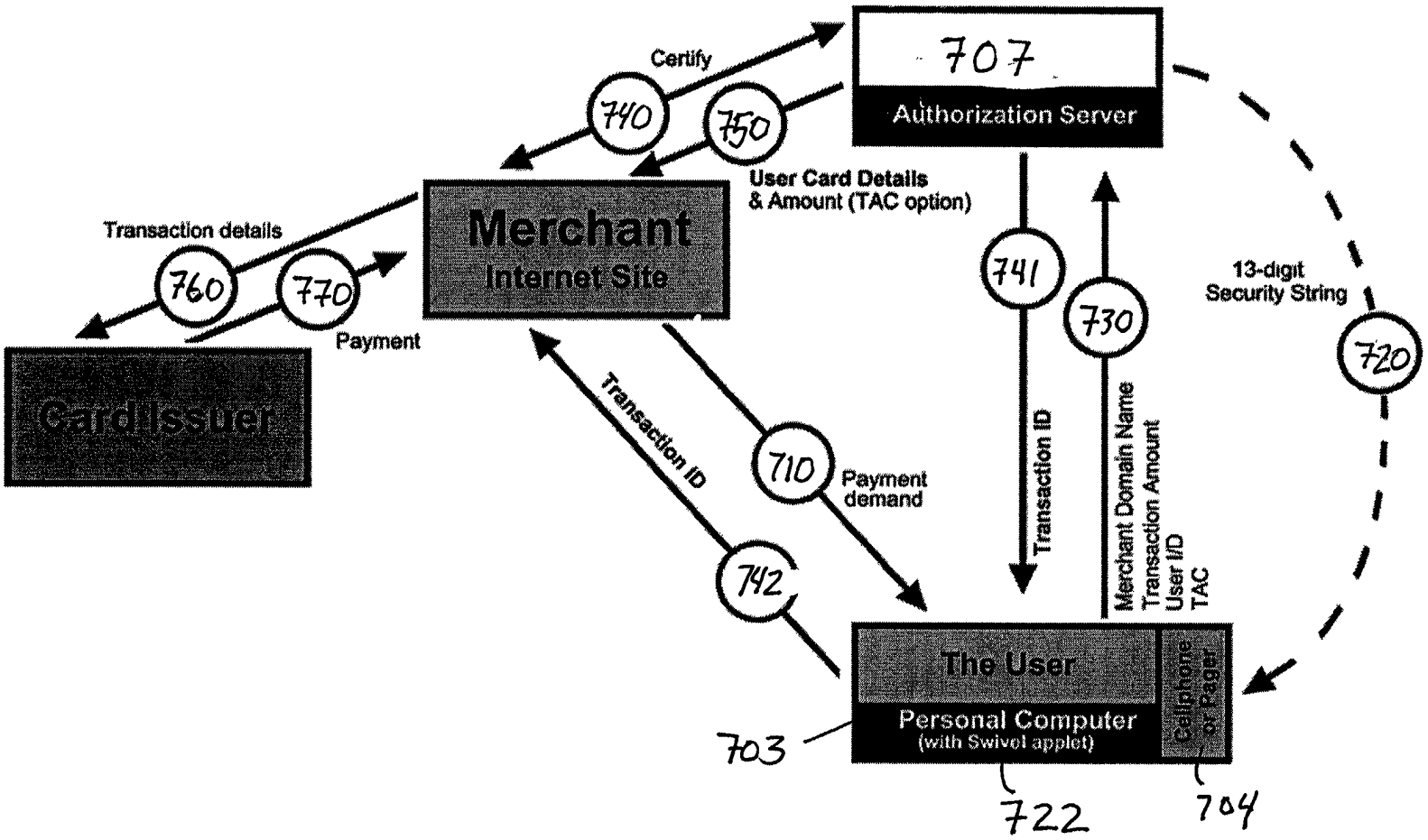
707
Authorization Server
Certify
740
750
User Card Details
& Amount (TAC option)
Merchant
Internet Site
Transaction details
760
770
Payment
Card Issuer
741
730
13-digit
Security String
720
Transaction ID
Merchant Domain Name
Transaction Amount
User I/D
TAC
710
Payment
demand
Transaction ID
742
The User
Personal Computer
(with Swivel applet)
Cellphone
or Pager
703
722
704

Figure 7

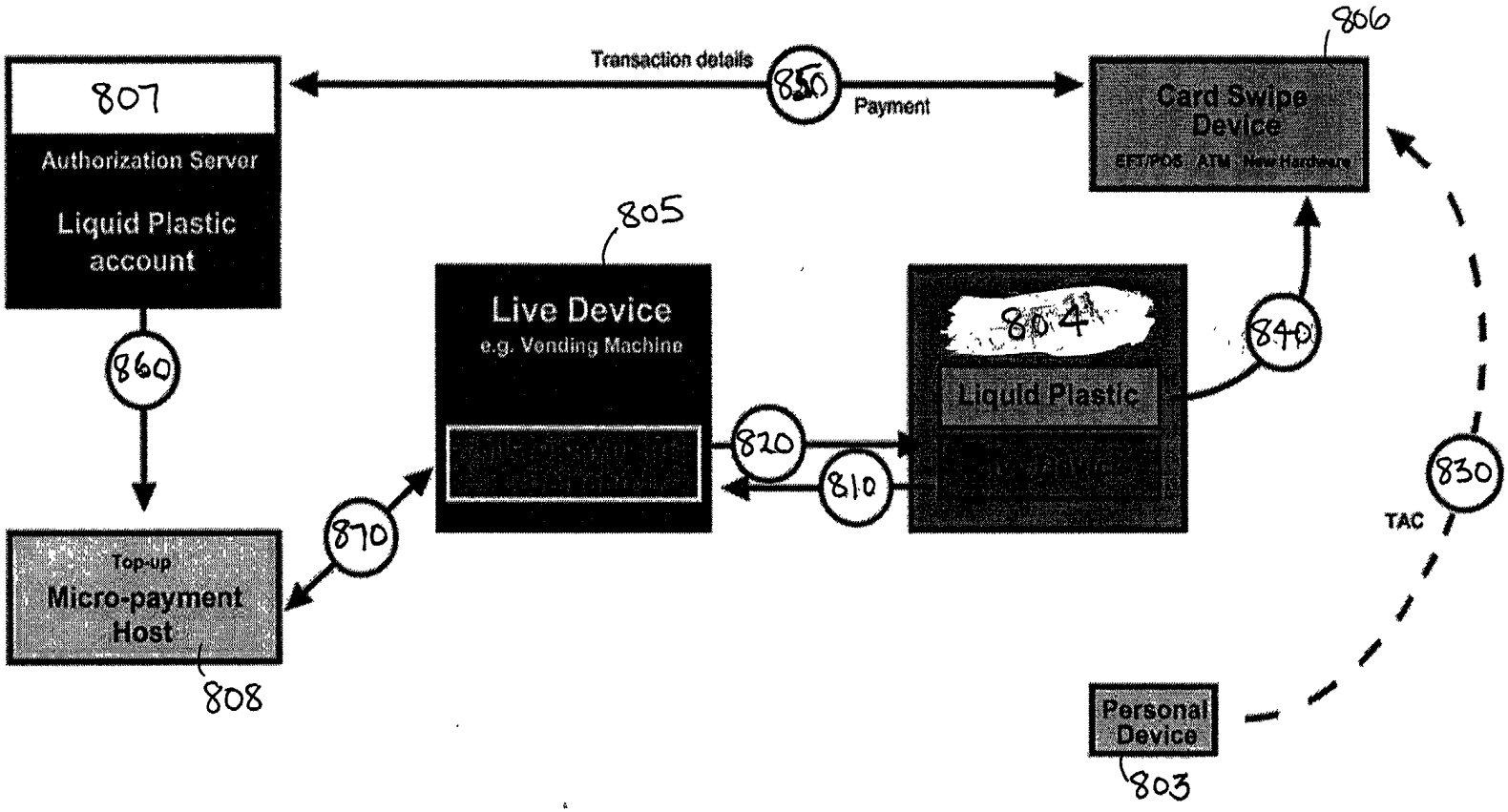
807
Authorization Server
Liquid Plastic account
Transaction details
850
Payment
806
Card Swipe Device
EFT/POS ATM New Hardware
805
Live Device
e.g. Vending Machine
804
Liquid Plastic
840
860
820
810
870
830
TAC
Top-up
Micro-payment Host
808
Personal Device
803

Figure 8

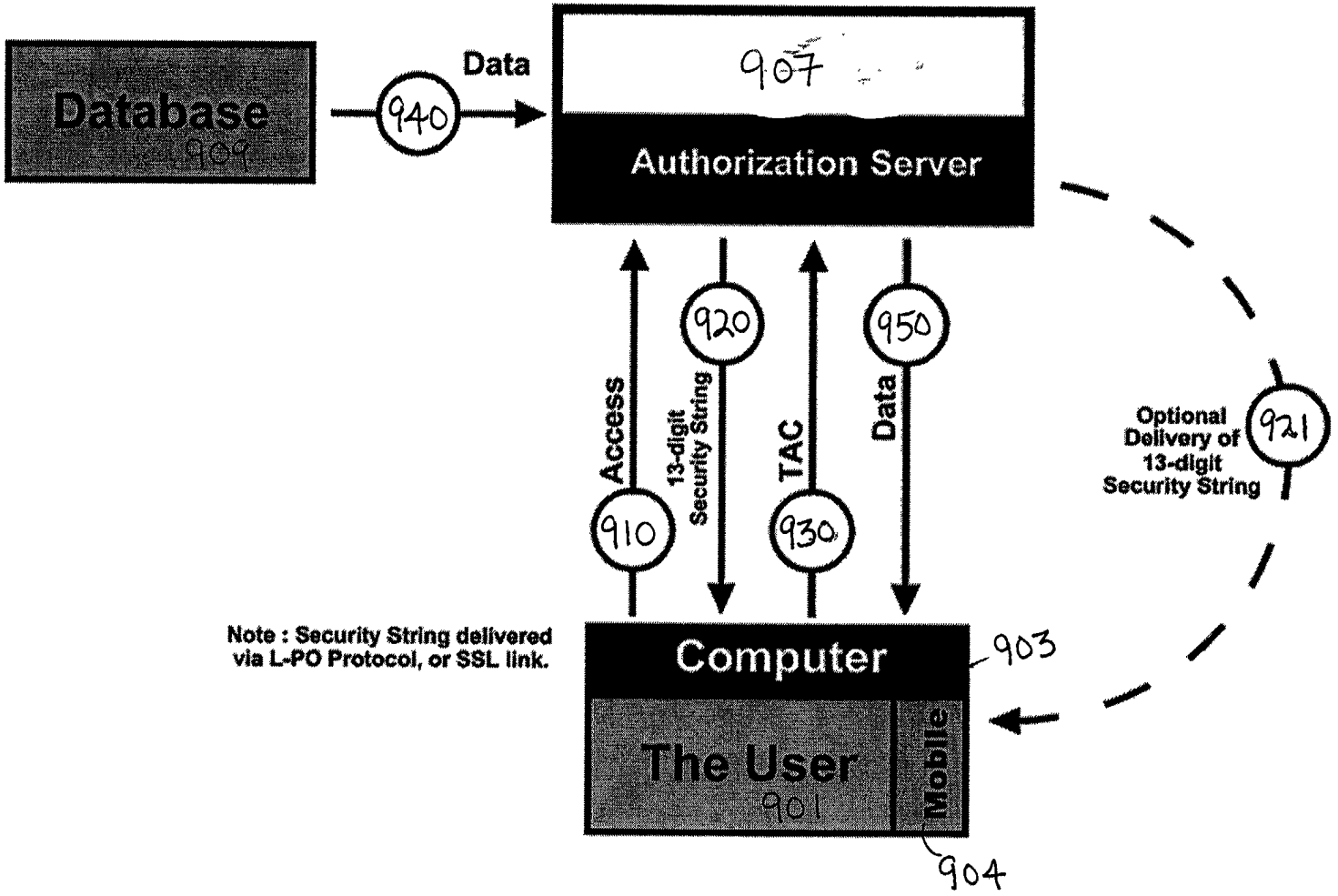
Database
909
Data
940
907
Authorization Server
Access
910
13-digit Security String
920
TAC
930
Data
950
Optional Delivery of 13-digit Security String
921
Note : Security String delivered via L-PO Protocol, or SSL link.
Computer
903
The User
901
Mobile
904

Figure 9

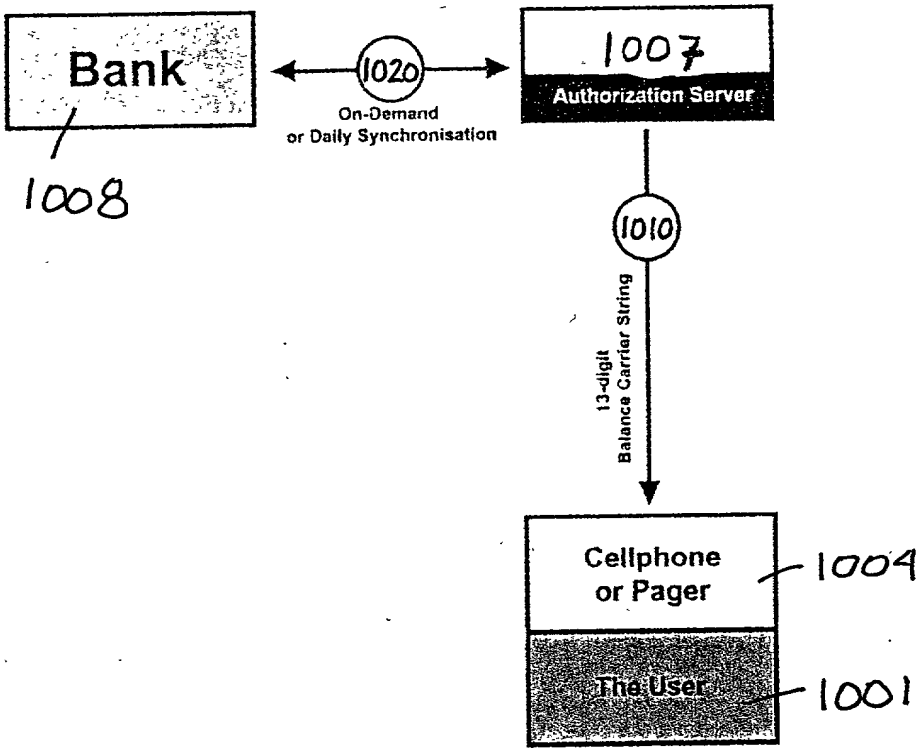

FIGURE 10

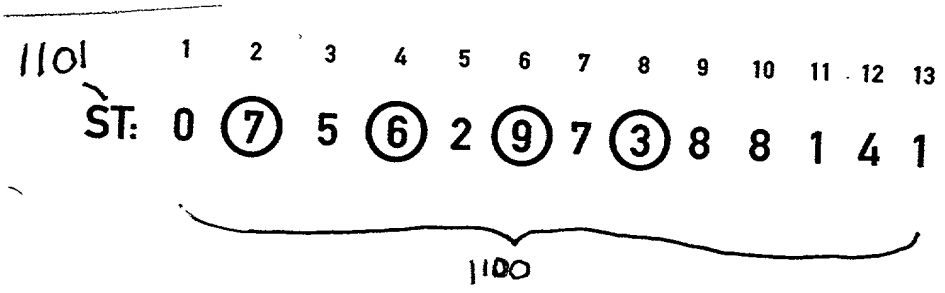

FIGURE 11

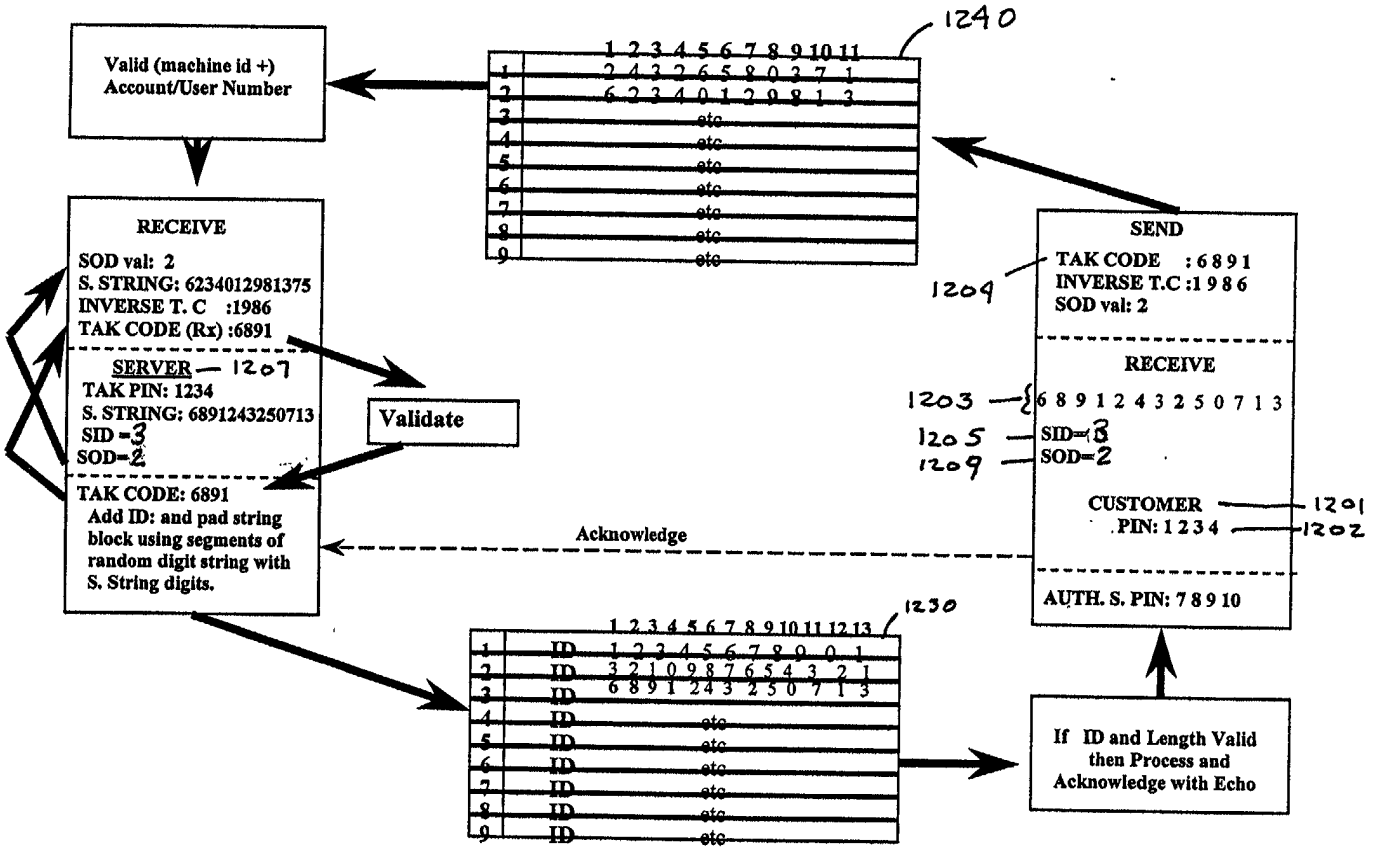
Valid (machine id +)
Account/User Number
1240
1 2 3 4 5 6 7 8 9 10 11
1 2 4 3 2 6 5 8 0 3 7 1
2 6 2 3 4 0 1 2 9 8 1 3
etc
RECEIVE
SOD val: 2
S. STRING: 6234012981375
INVERSE T. C :1986
TAK CODE (Rx) :6891
SERVER — 1207
TAK PIN: 1234
S. STRING: 6891243250713
SID =3
SOD=2
Validate
TAK CODE: 6891
Add ID: and pad string block using segments of random digit string with S. String digits.
1209
SEND
TAK CODE : 6891
INVERSE T.C :1986
SOD val: 2
RECEIVE
1203
6 8 9 1 2 4 3 2 5 0 7 1 3
1205
SID=3
1209
SOD=2
CUSTOMER
PIN: 1234
1201
1202
Acknowledge
AUTH. S. PIN: 7 8 9 10
1230
1 2 3 4 5 6 7 8 9 10 11 12 13
ID 1 2 3 4 5 6 7 8 9 0 0 1
ID 3 2 1 0 9 8 7 6 5 4 3 2 1
ID 6 8 9 1 2 4 3 2 5 0 7 1 3
ID etc
If ID and Length Valid then Process and Acknowledge with Echo

FIGURE 12

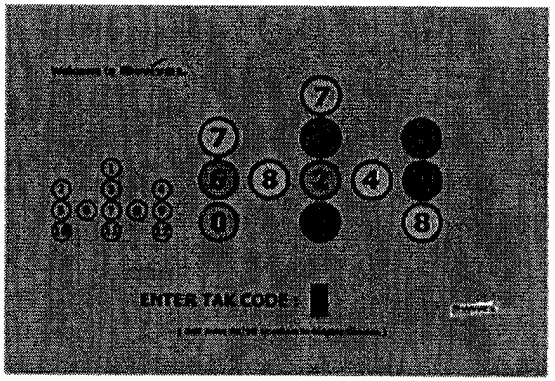

FIGURE 13a

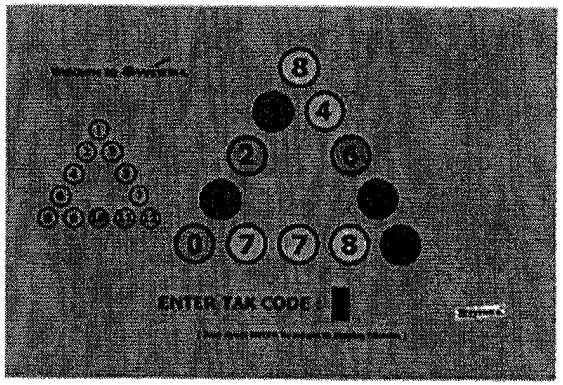

FIGURE 13b

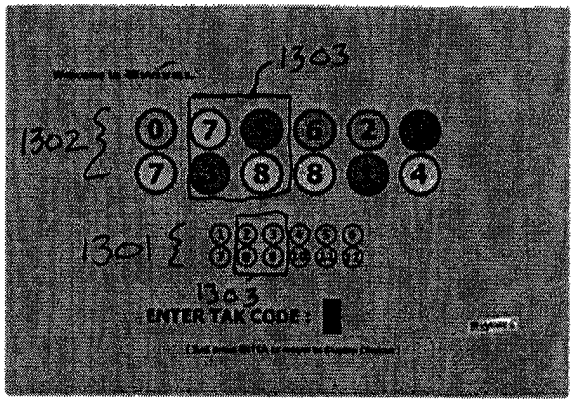

FIGURE 13e

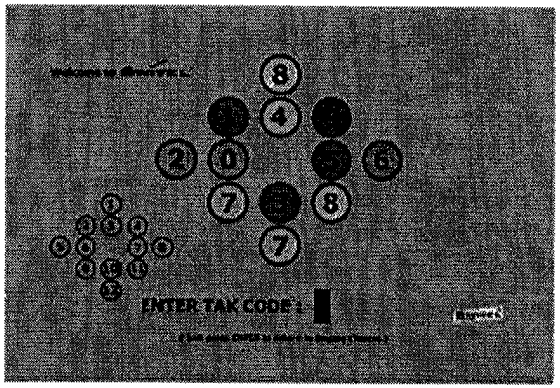

FIGURE 13d

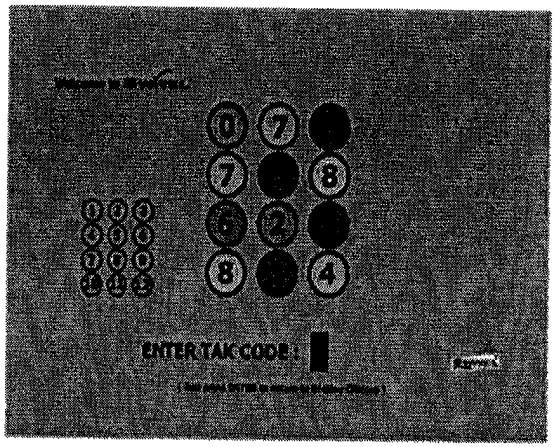

FIGURE 13e

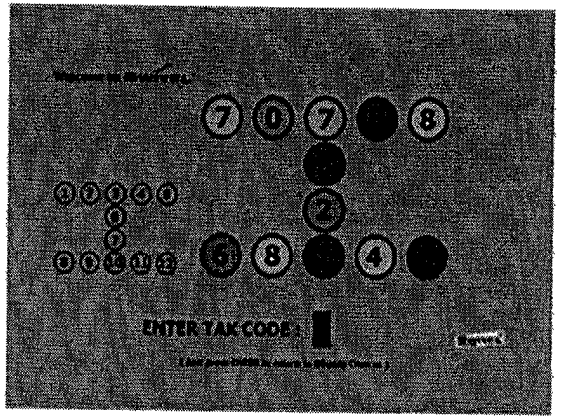

FIGURE 13f

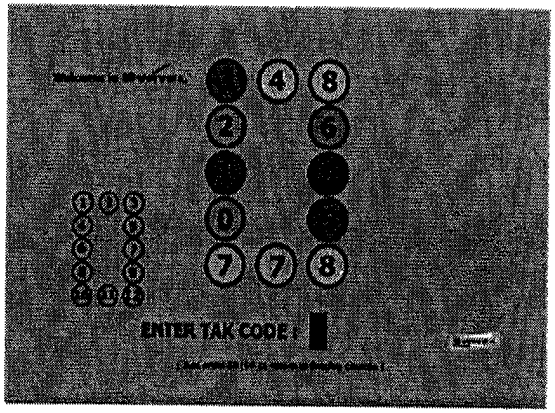

FIGURE 13g

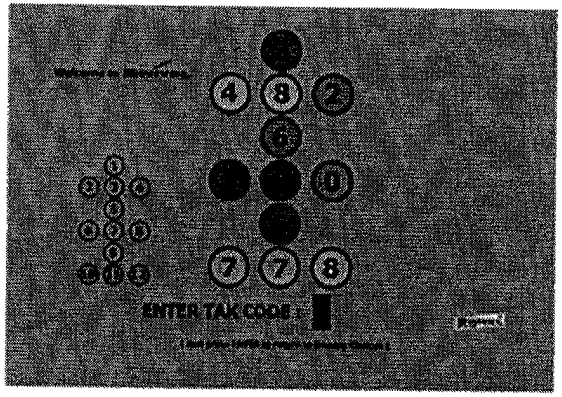

FIGURE 13h

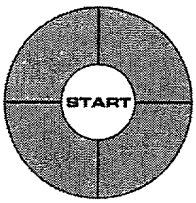

FIGURE 14

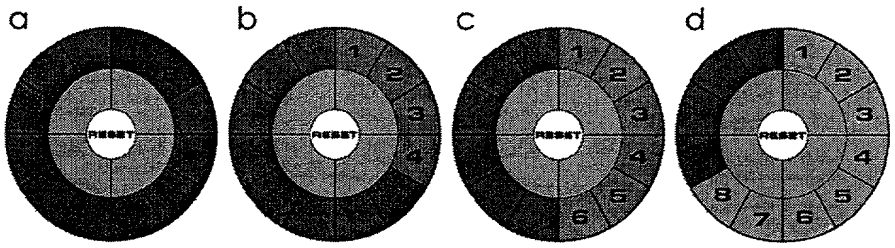

FIGURE 15a FIGURE 15b FIGURE 15c FIGURE 15d

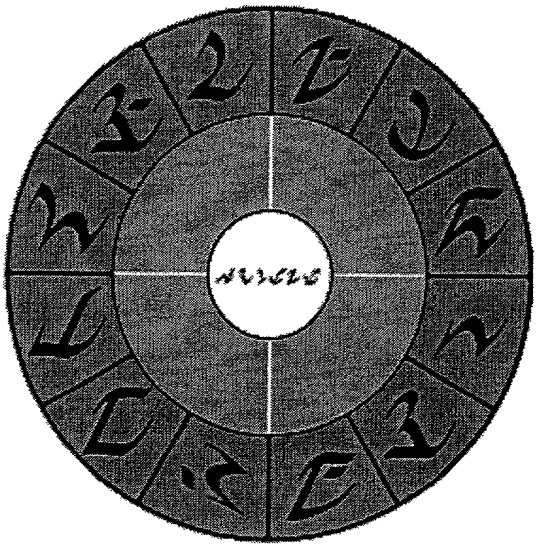

Figure 15e

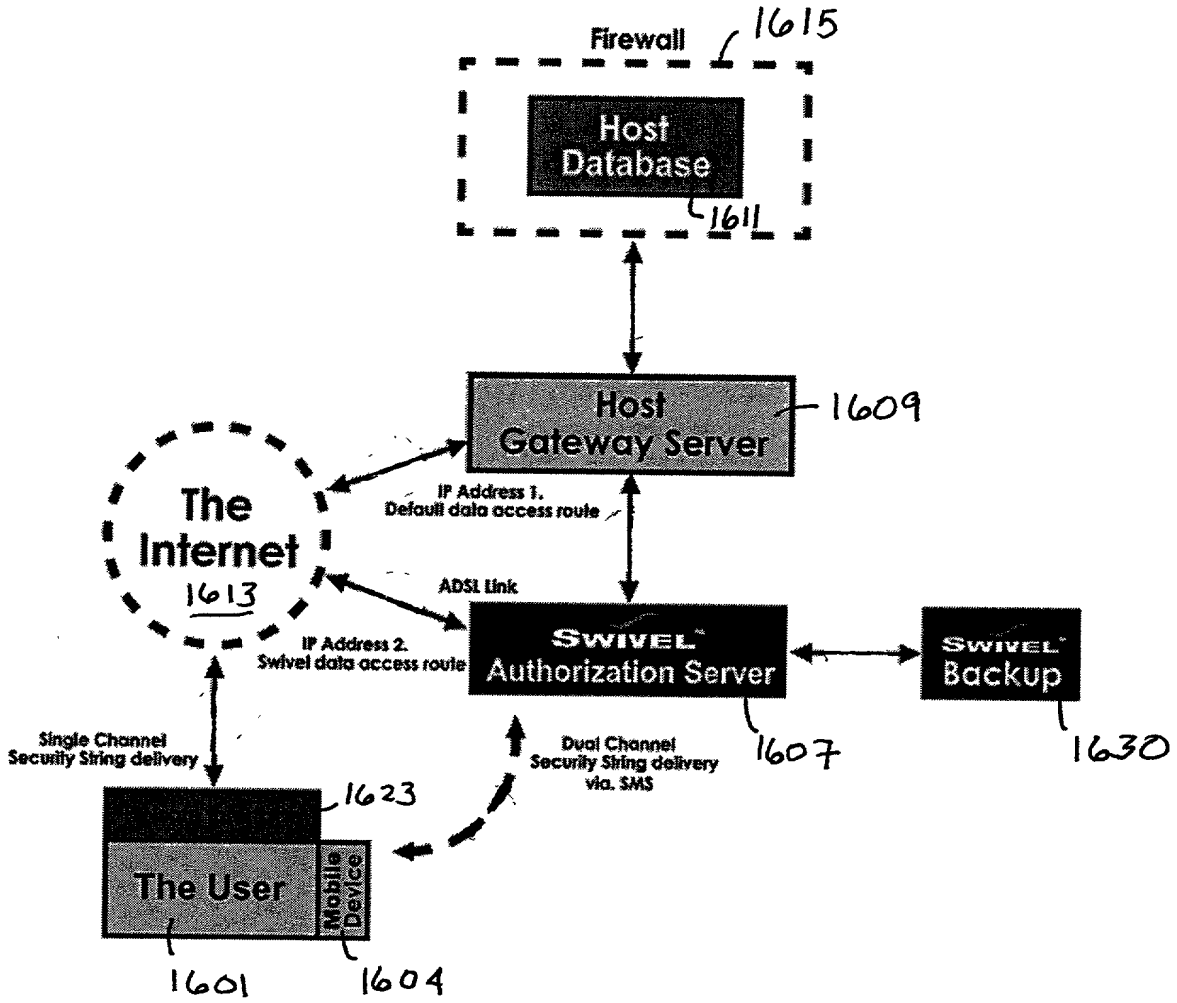
Firewall
1615
Host Database
1611
Host Gateway Server
1609
The Internet
1613
IP Address 1.
Default data access route
ADSL Link
IP Address 2.
Swivel data access route
SWIVEL Authorization Server
1607
SWIVEL Backup
1630
Single Channel Security String delivery
Dual Channel Security String delivery via. SMS
1623
The User
Mobile Device
1601
1604

FIGURE 16

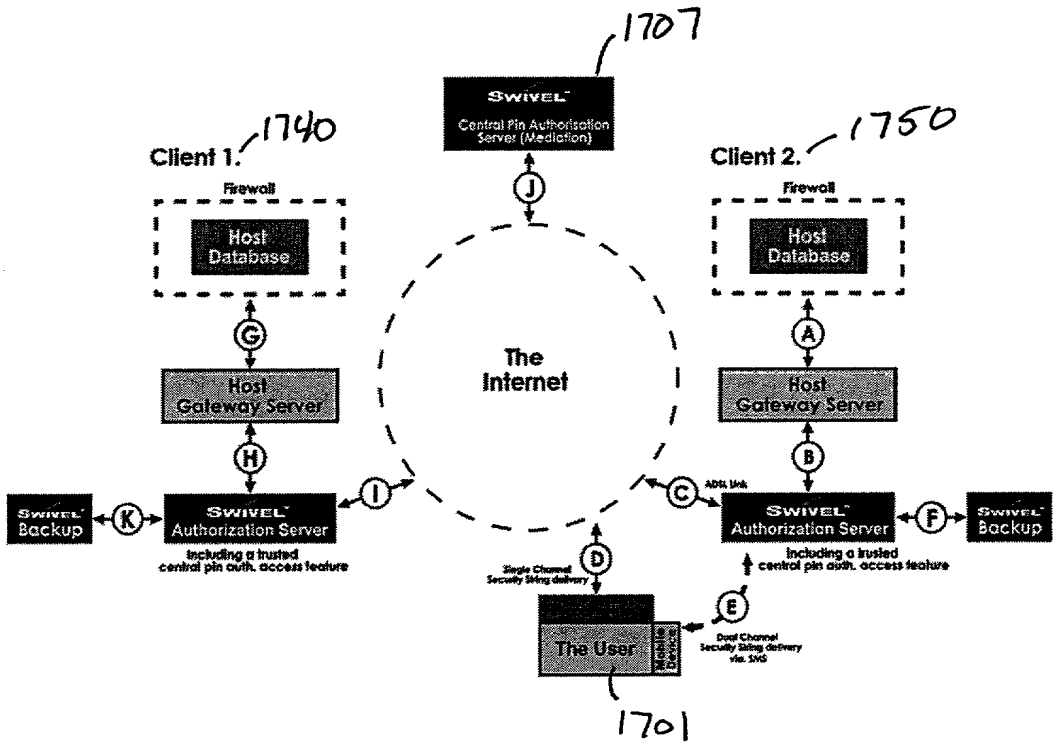
1707
SWIVEL
Central Pin Authorisation Server (Mediation)
1740
Client 1.
1750
Client 2.
Firewall
Host Database
Firewall
Host Database
The Internet
Host Gateway Server
Host Gateway Server
SWIVEL Backup
SWIVEL Authorization Server
including a trusted central pin auth. access feature
ADSL link
SWIVEL Authorization Server
including a trusted central pin auth. access feature
SWIVEL Backup
Single Channel Security Sting delivery
Dual Channel Security Sting delivery via. SMS
The User
1701

FIGURE 17

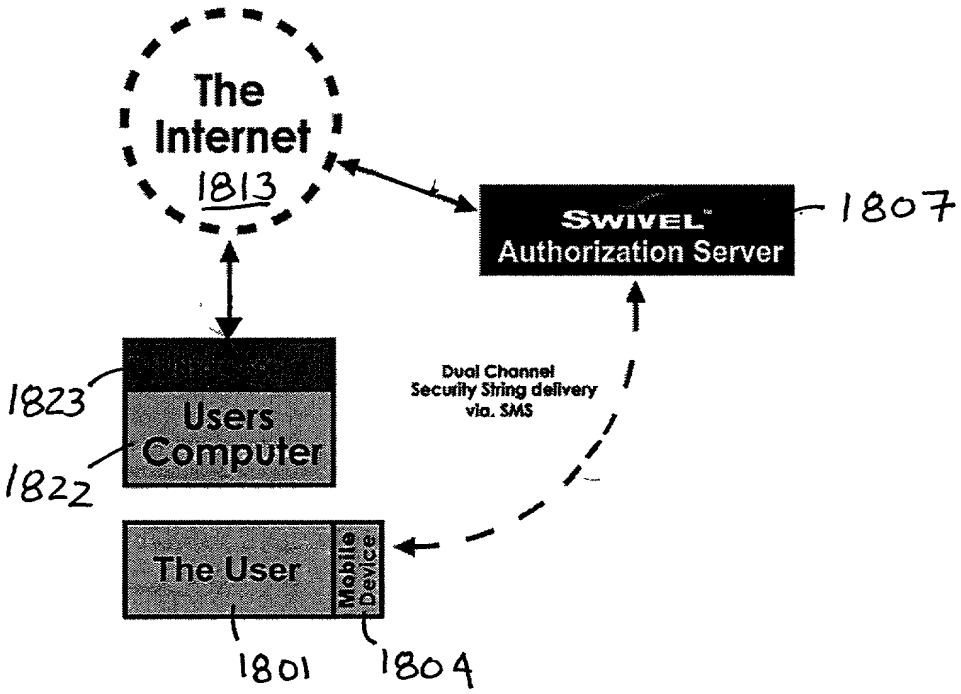
The Internet
1813
SWIVEL
Authorization Server
1807
1823
Users Computer
1822
Dual Channel
Security String delivery
via. SMS
The User
Mobile Device
1801
1804

FIGURE 18

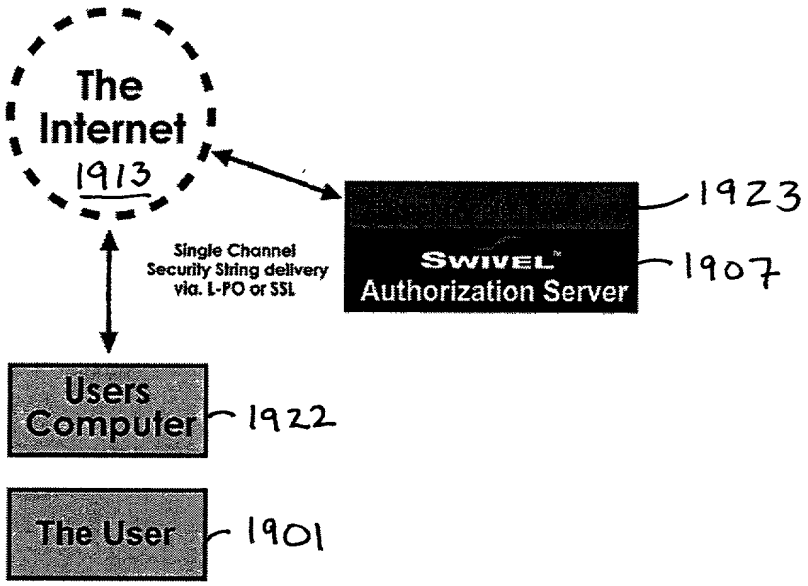
The Internet
1913
1923
Single Channel
Security String delivery
via. L-PO or SSL
SWIVEL
Authorization Server
1907
Users Computer
1922
The User
1901

FIGURE 19

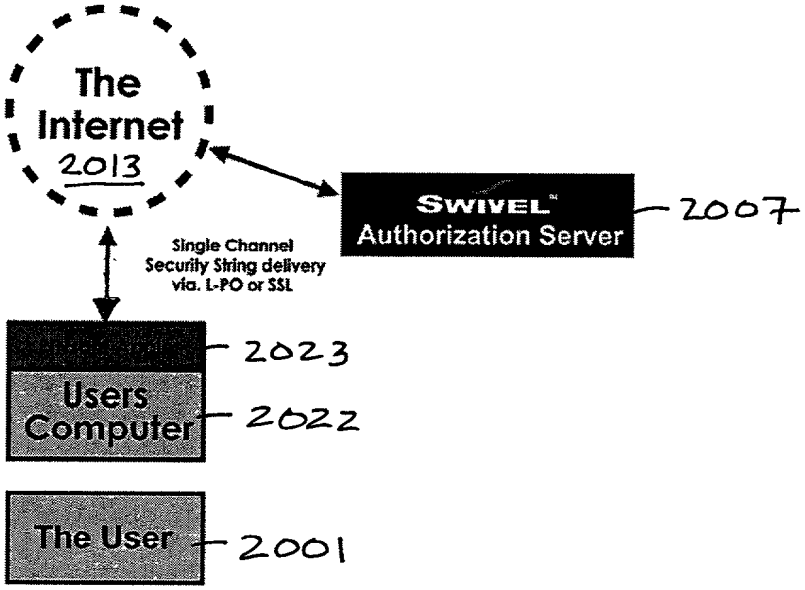

FIGURE 20

Confidential - Do Not Copy

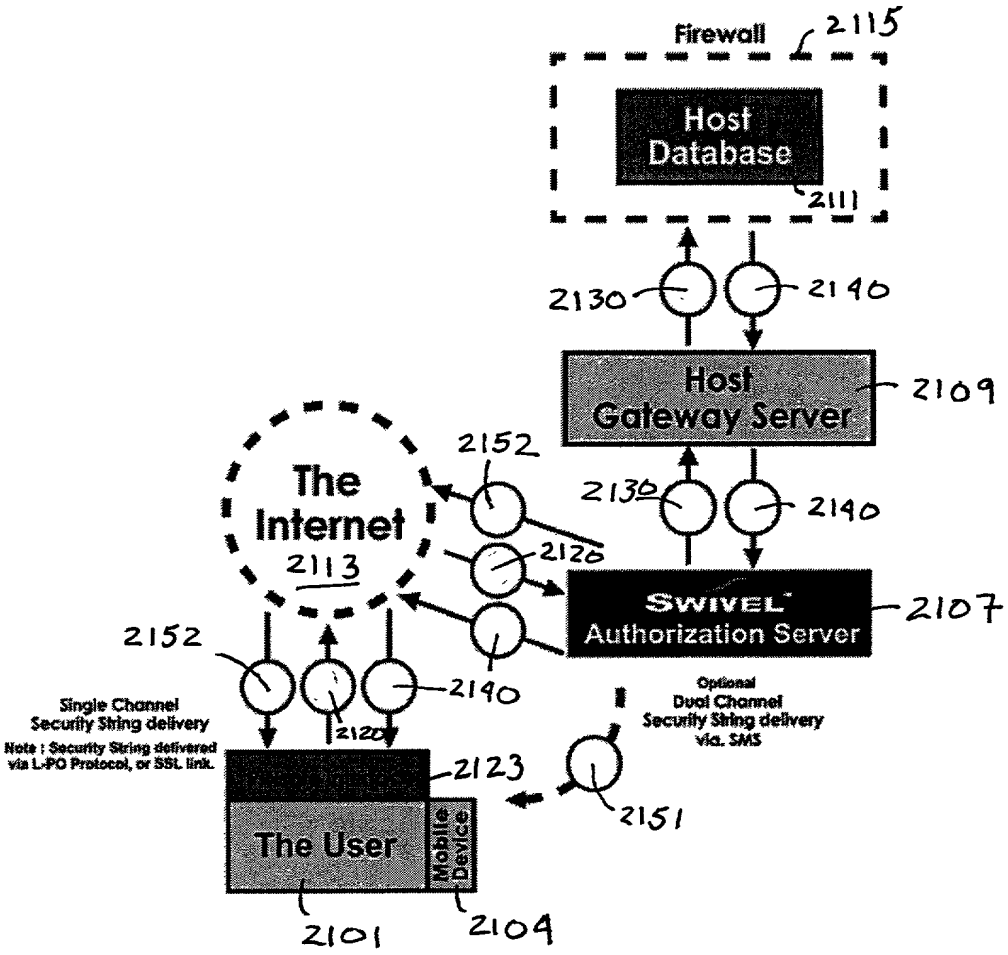
Firewall
2115
Host Database
2111
2130
2140
Host Gateway Server
2109
2152
The Internet
2113
2120
2130
2140
SWIVEL
Authorization Server
2107
2152
2140
Single Channel Security String delivery
Note : Security String delivered via L-PO Protocol, or SSL link.
2120
Optional
Dual Channel Security String delivery via. SMS
2123
2151
The User
Mobile Device
2101
2104

FIGURE 21

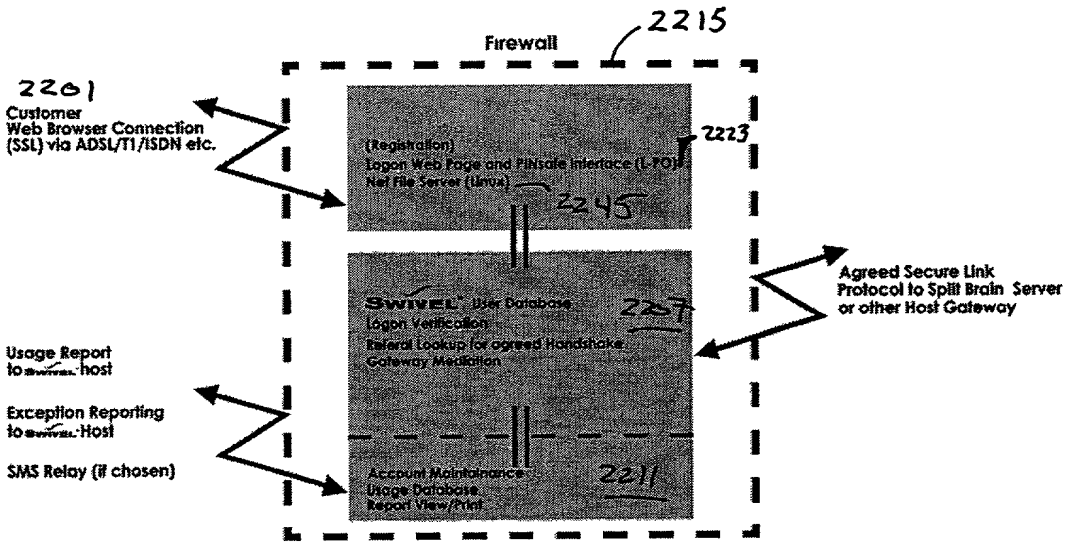

FIGURE 22

Document ID: US 8,484,701 B2

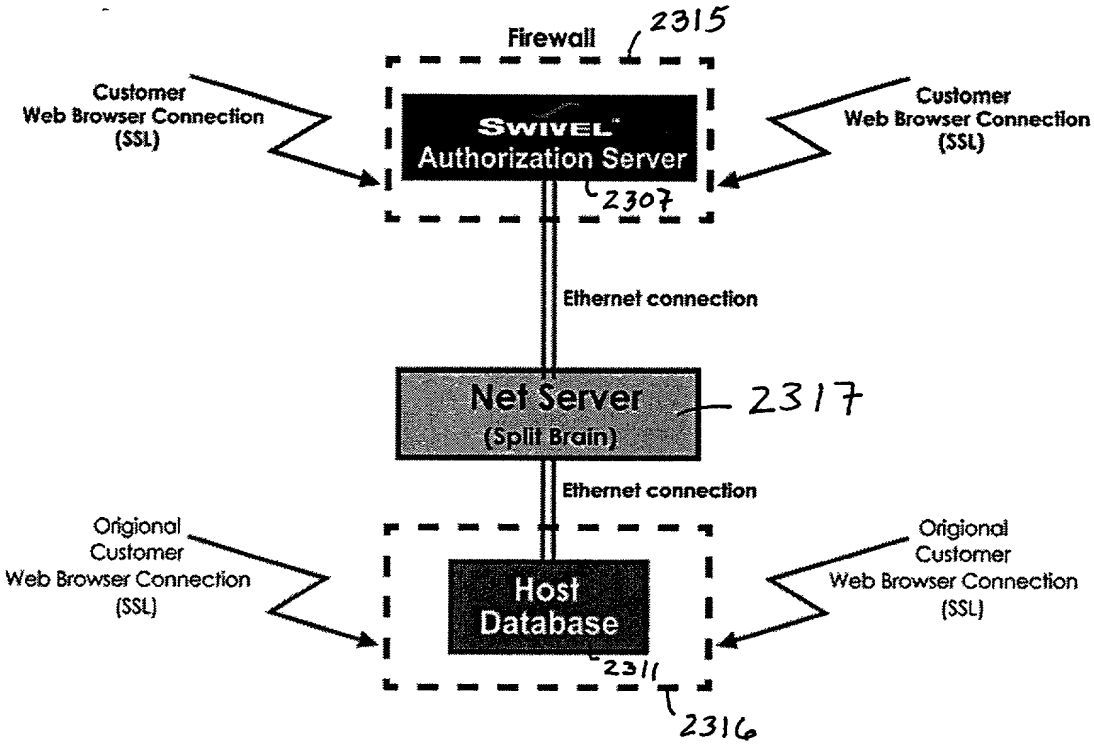

FIGURE 23

Document ID: 20070143